Tool Improvement Project

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Part I: Overview of Business Geater Machining and Manufacturing, Co. (GMM) has been servicing the aerospace, electronic and high-tech industries since 1962. Our high quality parts and outstanding on-time delivery have developed GMM's reputation into one that is synonymous with trust, and setting high standards for precision machined and fabricated parts.

Part II: Job Specifics

- Many products are first made into a 3d model from the customer drawing using CAD.
- Next they are made into a program which consist of NC codes and toolpaths for the CNC machines to run the part. This is done using CAM.
- The machinists prepare the fixtures and clamps, set-up all of the tools and adjust the program to make quality parts. They use computers at the machine and many precision measuring and hand tools.

Part III: Introduce the Problem
Machinists have found a problem with one of the lathe tool holders that they are using. The base is narrow and flimsy which allows the tool to flex causing chatter and uneven cutting. This, obviously causes the part to become cut inaccurately.

Part IV: Background
Students will need to:

- Become familiar with common terminology used in industry.
- Use safe practices.
- Learn how to use common precision measurement tools.
- Use brainstorming and teamwork skills to solve a problem.
- Learn the basics of CAD/CAM.
- Be introduced to CNC machining to produce a product.

Possible resources include: Geater Machining & Mfg. employees, MasterCam University, CNC Cookbook.com and other texts/manuals..

Part V: Business Solution

- The problem was defined.
- Brainstorming was used for possible solutions in which sketches were drawn using critical measurements.
- A 3D model was produced using MasterCam for visual accuracy and a 3D printer
- This model was used as a prototype to check for accuracy and adjustments were made to 3D drawing model.

Part VI: Student Solutions
I think that students will go through the process and come up with variations of the same solution of fixing the base.
Some might choose to design and produce a better tool holder.
Some will look for a solution on the internet and tell me to "Buy this one!" HaHa!

Business solution, cont'd

- Program including toolpaths and NC code was produced for use at CNC machines using MasterCam.
- Program was taken to CNC machine where a fixture was made, tools were put in holders & checked for runout and then placed in turret, stock was loaded, tools touched off and settings programmed in machine program.
- First part(set-up part) is machined, running through blocks of program one at a time. Adjustments to spindle speed and feed rates were made as necessary, part was checked for accuracy using precision measurement tools and more adjustments were made to program for production.
- Parts were produced, deburred, lightly sanded/ scotch brited and tumbled.
- They are now ready to be mounted on the lathe for use.